



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

May 12, 2011

Mr. Joseph E. Pollock  
Site Vice President  
Entergy Nuclear Operations, Inc.  
Indian Point Energy Center  
450 Broadway, GSB  
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 3 – NRC INTEGRATED  
INSPECTION REPORT 05000286/2011002

Dear Mr. Pollock:

On March 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Nuclear Generating Unit 3. The enclosed integrated inspection report documents the inspection results, which were discussed on April 18, 2011 with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings and one self-revealing finding of very low safety significance (Green), and one NRC-identified Severity Level IV finding. These findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they are entered into your corrective action program (CAP), the NRC is treating these as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region 1; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Indian Point Nuclear Generating Unit 3. In addition, if you disagree with the cross-cutting aspect assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region 1, and the NRC Senior Resident Inspector at Indian Point Nuclear Generating Unit 3.

In accordance with Title 10 of the Code of Federal Regulations Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink, appearing to read "Mel Gray", with a long, sweeping horizontal line extending to the right.

Mel Gray, Chief  
Projects Branch 2  
Division of Reactor Projects

Docket No. 50-286  
License No. DPR-26

Enclosure: Inspection Report No. 05000286/2011002  
w/ Attachment: Supplemental Information

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Sincerely,

/RA/

Mel Gray, Chief  
Projects Branch 2  
Division of Reactor Projects

Docket No. 50-286  
License No. DPR-26

Enclosure: Inspection Report No. 05000286/2011002  
w/ Attachment: Supplemental Information

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## U.S. Nuclear Regulatory Commission

## Region I

Docket No.: 50-286

License No.: DPR-26

Report No.: 05000286/2011002

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating Unit 3

Location: 450 Broadway, GSB  
Buchanan, NY 10511-0249

Dates: January 1, 2011 through March 31, 2011

Inspectors: P. Cataldo, Senior Resident Inspector – Indian Point 3  
M. Halter, Resident Inspector – Indian Point 3  
C. Newport, Acting Resident Inspector – Indian Point 3  
J. Noggle, Sr. Health Physicist – Region 1  
T. O'Hara, Reactor Engineer – Region 1  
E. Gray, Reactor Engineer – Region 1

Approved By: Mel Gray, Chief  
Projects Branch 2  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

IR 05000286/2011002; 1/1/11 – 3/31/11; Indian Point Nuclear Generating (Indian Point) Unit 3; Inservice Inspection and Operability Evaluations.

This report covered a three-month period of inspection by resident and region-based inspectors. One Severity Level IV (SL IV) finding and three additional findings of very low safety significance (Green) were identified. These findings were also determined to be violations of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." The cross-cutting aspects for the finding were determined using IMC 0310, "Components within the Cross-Cutting Areas." Findings for which the significance determination process does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### Cornerstone: Initiating Events

Green. The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," of very low safety significance (Green) because Entergy personnel did not adequately implement Boric Acid Control procedures. Specifically, Entergy personnel did not fully implement procedure EN-DC-319, "Inspection and Evaluation of Boric Acid Leaks" and Engineering Report IP-RPT-07-00093, "Boric Acid Corrosion Control Program," and conduct boric acid evaluations or implement adequate monitoring actions for an identified leak from the lower thermal barrier flange joint (a bolted connection with a gasket) associated with the 32 RCP between 2005 and 2011. This issue was entered into the Entergy corrective action program as condition report (CR)-IP3-2011-01546. Corrective actions included performing the required evaluation in 2011 (3R16) and implementing leak monitoring actions for the next operating cycle.

The inspectors determined the finding was more than minor because the finding is associated with the Equipment Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as at power operations. Additionally, the inspectors determined that more than minor example 4.a of IMC 0612, Appendix E was similar because Entergy personnel had not performed engineering evaluations on this boric acid leak from 2005 - 2011. The inspectors completed Attachment 0609.04, Phase 1- Initial Screening and Characterization of Findings and screened the finding in accordance with Table 4a. The inspectors concluded that, assuming the worst case degradation of the leakage condition, this condition would not result in exceeding the Technical Specification (TS) limit for identified leakage and that the finding would not be likely to affect other mitigation systems which could result in a loss of safety function. Therefore, the inspectors determined this finding was of very low safety significance.

The inspectors determined this finding had a cross-cutting in the area of Human Performance associated with the Work Practice attribute because Entergy personnel did not follow procedures as written. (H.4(b) per IMC 0310) (Section 1R08)

### **Cornerstone: Mitigating Systems**

- SL IV. The inspectors identified a Severity Level IV, NCV of 10 CFR 50.73(a)(2)(i)(B), because Entergy personnel did not provide a written Licensee Event Report (LER) to the NRC within 60 days of identifying a condition which was prohibited by plant Technical Specifications (TS) 3.8.4, "DC Sources – Operating."

On October 13, 2010, Entergy personnel identified the 31 battery charger (BC) had low and non-adjustable float voltage during the weekly battery inspection surveillance. That the same day, the 31 static inverter unexpectedly and automatically transferred to its alternate power source, and the installed spare battery charger was subsequently placed in service. Entergy staff completed an apparent cause evaluation (ACE) for this event on November 1, 2010. In the ACE, Entergy staff documented their determination that the 31 battery charger had been incapable of performing its safety function and classified the issue as a maintenance rule functional failure because the 31 battery charger had failed to provide reliable output voltage. Subsequent to the inspectors' questioning, Entergy personnel performed a past operability review and determined that the 31 battery charger was inoperable and left in service for 8 hours and 27 minutes, thus exceeding the TS AOT of two hours. Based on this review, Entergy personnel concluded that the condition met the criteria for reporting under 10 CFR 50.73(a)(2)(i)(B) and that a 60-day report was required to have been submitted to the NRC. Entergy's completed corrective actions included the initiation of CR-IP3-2011-00092, and the performance of a past operability review. Planned corrective actions include the submittal of a licensee event report (LER) to the NRC.

This violation involved a failure to make a required report to the NRC and is considered to impact the regulatory process. Such violations are dispositioned using the traditional enforcement process instead of the Significance Determination Process. Using the Enforcement Policy Section 6.9, "Inaccurate and Incomplete Information or Failure to Make a Required Report," example (d)(8), which states "A licensee fails to make a report required by 10 CFR 50.72 or 10 CFR 50.73," the NRC determined that this violation is more than minor and categorized as a Severity Level IV violation.

Because this violation involves the traditional enforcement process with no underlying technical violation that would be considered more than minor in accordance with IMC 0612, a cross-cutting aspect is not assigned to this violation. (Section 1R15.2)

Green. A self-revealing NCV of very low safety significance (Green) of 10 CFR 50, Appendix B, Criterion XI, 'Test Control,' was identified because Entergy personnel did not establish an adequate test program to assure that the 32 ABFP steam supply relief valve would perform satisfactorily. Specifically, Entergy personnel did not ensure the 'PCV-1139 Valve and Controller Replacement' modification (Minor Modification Package 97-3-320) acceptance values for the remote setpoint pressure regulating valve MS-PR-1139-5 were incorporated into testing procedures. Entergy personnel entered this issue into their CAP as CR-IP3-2011-00232. Corrective actions include performing a higher-

tier apparent cause evaluation, performing an operability evaluation and reviewing applicable procedures to ensure that control of the setpoint is maintained.

The finding was more than minor because the finding is associated with the Design Control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, as evidenced during the performance of 3-PT-120B on January 21, 2011, PCV-1139 did not maintain pressure in the normal band on startup and allowed pressure to increase to a level that allowed the steam supply relief valve, MS-52, to repeatedly lift, causing unanticipated unavailability of the 32 ABFP. The inspectors evaluated the finding in accordance with IMC 0609, Attachment 4, 'Phase 1 – Initial Screening and Characterization of Findings,' and determined it was of very low safety significance (Green), because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and was not risk significant with respect to external initiating events.

The inspectors determined that this finding had a cross-cutting aspect in the resources program area of Human Performance because Entergy personnel did not ensure that complete, accurate and up-to-date design documentation and procedures were adequate to assure nuclear safety. Specifically, Entergy personnel did not properly incorporate into procedures the acceptance values for the remote setpoint pressure regulating valve. (H.3(b) per IMC 0310) (Section 1R15.3)

Green. The inspectors identified a NCV of very low safety significance (Green) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Entergy personnel did not identify and correct a condition adverse to quality with regard to packing leakoff reservoir drain line blockage for the 32 ABFP which likely existed for some timeframe between October 2010 and January 2011. Specifically, Entergy personnel did not identify and correct inappropriate application of sealant coupled with drain line blockage that resulted in inadequate drainage of the leakoff reservoir associated with the 32 ABFP. This condition most likely resulted in water intrusion into the pump's outboard bearing housing in January 2011. Entergy personnel entered this issue into their CAP as CR-IP3-2011-00018. Corrective actions included the performance of a higher-tier apparent cause evaluation for the oil/water mixture identified; flush, drain and refill of the affected bearing housing to remove residual water contamination; and removal of the sealant on the pump leakoff reservoir drain to prevent recurrence.

The finding was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected its objective of ensuring the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the water intrusion in the bearing housing as a result of the performance issue could adversely impact the bearing cooling function of the pump. The inspectors determined the finding was of very low safety significance (Green) in accordance with Table 4a of IMC 0609, Attachment 4, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors concluded that the water intrusion in the 32 ABFP pump outboard bearing housing, while it caused unanticipated unavailability, did not result in a loss of operability or safety function of the 32 ABFP and was not risk significant with respect to external initiating events.



This finding has a cross-cutting aspect in the area of Problem Identification and Resolution associated with the attribute of the corrective action program because Entergy personnel did not thoroughly identify and correct drain line blockage indications for the turbine-driven ABFP. (P.1(a) per IMC 0310) (Section 1R15.4)

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## REPORT DETAILS

Summary of Plant Status

Indian Point Unit 3 began the inspection period operating at full reactor power (100%). On February 22, 2011, Entergy operators identified a service water leak and initiated a controlled shutdown to Mode 4, performed a temporary repair of the degraded piping, and returned the Unit to 100% power on February 28, 2011. Additionally, on March 8, 2011, a planned downpower was initiated that culminated in the Unit being taken off-line to begin refueling outage No. 16 (3R16). The Unit remained off-line for the remainder of the inspection period.

**1. REACTOR SAFETY****Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity****1R01 Adverse Weather Protection (71111.01 – 1 sample)**Impending Cold Weather Review**a. Inspection Scope**

The inspectors performed a detailed review of Entergy procedures and actions to address an impending snow storm forecasted on January 11 and 12, 2011. This review evaluated Entergy staff's preparation and readiness for the impending storm, including applicable compensatory measures, as well as inspector-conducted walk downs of plant equipment and general plant areas. In addition, the inspectors reviewed the status of deficiencies identified during the current cold weather seasonal preparations, and verified that adverse conditions were being adequately addressed to ensure the impending cold weather conditions would not have significant impact on plant operation and safety. The inspectors conducted the review to verify that the station's implementation of OAP-008, "Severe Weather Preparations," and OAP-048, "Seasonal Weather Preparation," appropriately maintained systems required for normal operation and safe shutdown conditions. The documents reviewed during this inspection are listed in the Attachment. This review of impending storm preparations represented one inspection sample.

**b. Findings**

No findings were identified.

**1R04 Equipment Alignment**Partial System Walkdowns (71111.04Q – 3 samples)**a. Inspection Scope**

The inspectors performed partial system walkdowns to verify the operability of redundant or diverse trains and components during periods of system train unavailability, and where applicable, following return to service after maintenance. The inspectors

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reviewed system procedures, the Updated Final Safety Analysis Report (UFSAR), and system drawings to verify that the alignment of the applicable system or component supported its required safety functions. The inspectors also reviewed applicable condition reports or work orders to ensure that Entergy personnel had identified and properly addressed equipment deficiencies that could potentially impair the capability of the available system or component. The documents reviewed during this inspection are listed in the Attachment. The inspectors performed a partial walkdown on the following systems, which represented three inspection samples:

- 32 auxiliary boiler feedwater pump following troubleshooting and repair activities on January 22, 2011;
- 33 safety injection pump following surveillance testing (3-PT-Q116C) on March 2, 2011; and
- 32/33 emergency diesel generators (EDGs) during a maintenance outage on the 31 emergency diesel generator on March 23, 2011.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 6 samples)

a. Inspection Scope

The inspectors conducted tours of selected Unit 3 fire areas to assess the material condition and operational status of applicable fire protection features. The inspectors reviewed, consistent with the applicable administrative procedures, whether: combustible material and ignition sources were adequately controlled; passive fire barriers, manual fire-fighting equipment, and suppression and detection equipment were appropriately maintained; and compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with Entergy's fire protection program. The inspectors also evaluated the fire protection program for conformance with the requirements of License Condition 2.K. The documents reviewed during this inspection are listed in the Attachment.

- Pre-Fire Plan (PFP)-301;
- PFP-302;
- PFP-303;
- PFP-351;
- PFP-352; and
- PFP-352A.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

a. Inspection Scope

The inspectors evaluated actions by Entergy staff to mitigate the potential effects of periodic groundwater intrusion of Cable Vault No. 34, which contains safety-related and non-safety related cables. This evaluation occurred during Entergy's performance of the quarterly manhole and cable inspection activities, and verified whether Entergy personnel had appropriate water mitigation strategies, cable inspection and testing, and cable support inspections, to ensure continued operability and functionality of the associated components that are supplied electrical power by the cables that route through this vault. Additionally, as conditions warranted, the inspectors conducted an independent visual observation of the material condition of cables, associated supports, and cable splices in the vault. The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) (71111.08 – 1 sample)

a. Inspection Scope

The inspectors observed a selected sample of nondestructive examination (NDE) activities during the March 2011 refueling outage. Also, the inspectors reviewed the records of selected, additional samples of completed NDE and repair/replacement activities. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage. The inspector's observations and documentation reviews were performed to verify that the activities inspected were performed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements.

The inspectors reviewed records for ultrasonic testing (UT), visual testing (VT), penetrant testing (PT) and magnetic particle testing (MT) NDE processes. The inspectors reviewed inspection data sheets and documentation for these activities to verify the effectiveness of the examiner, process, and equipment in identifying degradation of risk significant systems, structures and components and to evaluate the activities for compliance with the requirements of ASME Code, Section XI.

Steam Generator Inspection Activities

The inspectors reviewed Entergy's Technical Specification (TS) 5.5.8, Steam Generator (SG) Programs, Engineering Report IP3-RPT-06-00186, Revision 1, 3/9/07; Steam Generator Degradation Assessment for 3R14 Refueling Outage and Engineering Report: 3R14 Condition Monitoring and Operational Assessment of Indian Point 3 Steam Generators, IP-RPT-07-00031, Revision 0, 3/24/07. The inspectors confirmed that,

based on this information, Entergy personnel were not required to inspect steam generators during the 3R16 outage in March 2011.

MRP-146 Examinations:

The inspectors reviewed the procedures used to perform ultrasonic inspection of three small bore piping sections connected to the reactor coolant system which are subject to low flow or stagnant flow conditions. The inspectors also reviewed the data sheets showing the results of these inspections.

Reactor Vessel Closure Head (RVCH) Inspections:

The inspectors reviewed Entergy's staff performance with regard to a VT, an Eddy Current (EC) examination and UT examination of the Unit 3 RVCH and the installed upper head penetrations. The inspectors reviewed the VT, EC and UT inspection procedures, the qualifications of the personnel performing the inspections, and reviewed the inspection report documenting the inspection results.

Section XI Repair/Replacement Samples:

The inspectors reviewed the repair/replacement 10-3-64/Work Order (WO) 226647-01 and included welding specifications and welding qualification records. This WO 226647-01 replaced a new containment spray vent valve.

Rejectable Indication Accepted For Service After Analysis:

The inspectors reviewed a sample of rejectable indications from previous outage inspections. The inspectors also reviewed the evaluations performed to justify continued operations with the conditions reported.

Boric Acid Corrosion Control Program Activities

The inspectors reviewed the Entergy boric acid corrosion control program, which included the resident inspectors observing Entergy personnel performing boric acid walkdown inspections inside containment, at the beginning of the Indian Point Unit 3 refueling outage. The inspectors reviewed a sample of the corrective action reports (CR) generated by the walkdowns and the evaluations conducted by Entergy engineers to disposition the notifications. Additionally, the inspectors reviewed a sample of CRs and corrective actions completed to repair the reported conditions.

b. Findings

Introduction. The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," of very low safety significance (Green) because Entergy personnel did not adequately implement Boric Acid Control procedures. Specifically, Entergy personnel did not adequately implement procedure EN-DC-319, "Inspection and Evaluation of Boric Acid Leaks" and Engineering Report IP-RPT-07-00093, "Boric Acid Corrosion Control Program," and conduct boric acid evaluations or implement adequate monitoring actions for an identified leak from the

lower thermal barrier flange joint (a bolted connection with a gasket) associated with the 32 RCP between 2005 and 2011.

Description. In 2005 (3R13), 2007 (3R14), and 2009 (3R15), Entergy personnel while performing post-shutdown boric acid walkdowns identified and reported an active main flange joint leak on the 32 RCP. In each instance Entergy personnel entered the leakage condition into the corrective action program but did not document evaluation of or implement monitoring actions consistent with station procedures to support continued operation of the 32 RCP without repair. Again in 2011 (3R16), Entergy personnel identified the leakage condition on the 32 RCP flange joint and reported the leak via CR-IP3-2011-01102.

The inspectors questioned whether Entergy personnel had previously or currently had evaluated this leakage condition on the 32 RCP flange joint. The inspectors' observations, based on visual inspection and document review during this refueling outage (3R16), affirmed this was an active boric acid leak at the flange joint, in part, because the volume and appearance of the boric acid residue observed each refueling outage indicated a leakage condition that would be indicative of a periodic leak during RCP heat-up and cooldown cycles at the RCP flange joint. However, the inspectors also determined that Entergy personnel did not perform a boric acid evaluation in 2005, 2007 or 2009, as required by quality-related procedure EN-DC-319, Section 5.2.4[4], which states, "For non-white, wet or excessive leaks, a BAC Evaluator shall evaluate the leak using guidance established in Attachment 9.4." Further, in 2005 (3R13), 2007 (13R 4), and 2009 (3R15), the inspectors determined Entergy personnel returned the 32 RCP to service without performing leakage monitoring as required by report IP-RPT-07-00093, paragraph 9.1.2.1, which states, "Active leaks, which cannot be promptly corrected without removing the system from service or without a plant shutdown, shall be monitored at least once per month unless a longer inspection period is demonstrated to be acceptable, to ensure that the leak rate is not increasing at unacceptable levels." IP-RPT-07-00093, as described in the procedure, is intended to be used in conjunction with EN-DC-319.

Based on inspector questions this outage, Entergy personnel subsequently completed a boric acid evaluation in accordance with procedure EN-DC-319, step 5.2.4[4], Screening, Evaluation, and Disposition of Leaks. Entergy personnel, based on their evaluation of the given leak condition, determined continued operation of the pump was acceptable and implemented interim actions and compensatory measures to monitor the leakage condition during operation in the next operating cycle. One of Entergy's corrective actions was installation of a camera to observe the leakage condition during plant operation.

The inspectors reviewed Entergy staff's evaluation and determined that continued operation of the 32 RCP with monitoring actions implemented by Entergy personnel was technically supportable and consistent with their procedures. Additionally, the inspectors noted that Entergy personnel had previously installed bolt covers for flange joint bolt protection and visual observation of the bolts (with covers removed) indicated no corrosion was evident.

Analysis. The performance deficiency was that Entergy personnel did not adequately implement boric acid corrosion control procedures for the leakage condition on the 32 RCP. The inspectors determined the finding is more than minor because the finding is associated with the Equipment Performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as at power operations. Additionally, the inspectors determined that more than minor example 4.a of IMC 0612, Appendix E was similar because Entergy personnel had not performed engineering evaluations on this boric acid leak from 2005 - 2011.

The inspectors completed Attachment 0609.04, Phase 1- Initial Screening and Characterization of Findings and screened the finding in accordance with Table 4a. The inspectors concluded that, assuming the worst case degradation of the leakage condition, this condition would not result in exceeding the Technical Specification limit for identified leakage and that the finding would not be likely to affect other mitigation systems which could result in a loss of safety function. Therefore, the inspectors determined this finding was of very low safety significance (Green).

The inspectors determined this finding had a cross-cutting aspect in the area of Human Performance associated with the Work Practice attribute because Entergy personnel did not follow procedures as written to evaluate and monitor the 32 RCP flange leak. (H.4(b) per IMC 0310)

Enforcement. 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Quality-related procedure EN-DC-319, Section 5.2.4[4], states: "For non-white, wet or excessive leaks, a BAC Evaluator shall evaluate the leak using guidance established in Attachment 9.4." Further, IP-RPT-07-00093 which is to be used in conjunction with EN-DC-319, states in paragraph 9.1.2.1: "Active leaks, which cannot be promptly corrected without removing the system from service or without a plant shutdown, shall be monitored at least once per month unless a longer inspection period is demonstrated to be acceptable, to ensure that the leak rate is not increasing at unacceptable levels."

Contrary to the above, Entergy personnel did not perform a written boric acid evaluation for an active flange leak on the 32 RCP nor implement adequate monitoring actions when the leakage condition was identified in 2005, 2007 and 2009 prior to returning the 32 RCP to operation in the subsequent operating cycles. Because the issue has been entered into the corrective action process (CR-IP3-2011-01546) and because it is of very low safety significance (Green), it is being treated as a non-cited violation consistent with Section 2.3.2. of the NRC Enforcement Policy. **(NCV 50-286/2011002-01, Entergy Personnel Did Not Evaluate and Monitor a Thermal Barrier Boric Acid Leak)**

1R11 Licensed Operator Requalification Program (71111.11Q – 1 sample)Quarterly Reviewa. Inspection Scope

On February 9, 2011, the inspectors observed licensed-operator requalification training conducted in the plant reference simulator, which focused on normal and abnormal operations associated with the residual heat removal (RHR) system, with particular focus on outage-related activities. The inspectors verified the training was conducted in accordance with a training plan that contained appropriate objectives for the proposed training session. The inspectors verified the operator training was consistent in accordance with the requirements of 10 CFR 55, "Operator Licenses." The documents reviewed during this inspection are listed in the Attachment. This observation of licensed-operator training represented one inspection sample.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)a. Inspection Scope

The inspectors reviewed performance-based problems that involved selected structures, systems, and components (SSCs) to assess the effectiveness of maintenance activities and to verify activities were conducted in accordance with site procedures and 10 CFR 50.65 (The Maintenance Rule). When applicable, the reviews focused on:

- Evaluation of Maintenance Rule scoping and performance criteria;
- Verification that reliability issues were appropriately characterized;
- Verification of proper system and/or component unavailability;
- Verification that Maintenance Rule (a)(1) and (a)(2) classifications were appropriate;
- Verification that system performance parameters were appropriately trended;
- For SSCs classified as Maintenance Rule (a)(1), that goals and associated corrective actions were adequate and appropriate for the circumstances; and
- Identification of common cause failures.

The inspectors also reviewed system health reports, maintenance backlogs, and Maintenance Rule basis documents. The documents reviewed during this inspection are listed in the Attachment. The following systems and/or components were reviewed and represented two inspection samples:

- Preventive maintenance activities on the 31 static inverter; and
- CH-MOV-250C actuator grease replacement on March 15, 2011.



b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)a. Inspection Scope

The inspectors reviewed maintenance activities to verify that the appropriate on-line risk assessments were performed prior to removing equipment for work as required by 10 CFR 50.65(a)(4). When planned work scope or schedules were altered to address emergent or unplanned conditions, the inspectors verified that the plant risk was promptly reassessed and managed by station personnel. The documents reviewed during this inspection are listed in the Attachment. The following activities represented six inspection samples:

- Unplanned maintenance on the 32 auxiliary boiler feedwater pump (ABFP) on January 21, 2011;
- Unplanned maintenance on the 33 static inverter on January 25, 2011;
- Unplanned increase in Green Risk on March 1, 2011;
- First transition to 3R16 Green shutdown risk on March 9, 2011;
- Planned Yellow shutdown risk on March 11, 2011; and
- Unplanned risk due to a loss of DC power on March 25, 2011.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 7 samples).1 Resident Quarterly Reviewa. Inspection Scope

The inspectors reviewed operability evaluations to assess the acceptability of the evaluations, the use and control of compensatory measures when applicable, and compliance with Technical Specifications. These reviews were conducted to verify that operability determinations were performed in accordance with procedure EN-OP-104, "Operability Determinations." The inspectors assessed the technical adequacy of the evaluations to ensure consistency with the UFSAR and associated design and licensing basis documents. The documents reviewed are listed in the Attachment. The following operability evaluations were reviewed and represented seven inspection samples:

- CR-IP3-2011-00098, 31 battery charger failure, on January 11, 2011;
- 33 battery charger return-to-service on January 19, 2011;
- 33 charging pump trip on January 20, 2011;
- 3-PT-Q120B, 32 ABFP surveillance and IST, on January 21, 2011;
- CR-IP3-2011-00496, service water supply pipe thinning, on February 9, 2011;

- CR-IP3-2011-00680, service water piping leak, on February 22, 2011; and
- Service water system UT inspection weld thickness results on March 9, 2011.

b. Findings

.2 Failure to Submit an LER for a Condition Prohibited By TS Associated With 31 Battery Charger Inoperability

Introduction: The inspectors identified a Severity Level IV, NCV of 10 CFR 50.73(a)(2)(i)(B), because Entergy personnel did not provide a written Licensee Event Report (LER) to the NRC within 60 days of identifying a condition which was prohibited by plant Technical Specifications (TS) 3.8.4, "DC Sources – Operating."

Description: On October 13, 2010 at 12:58 pm, while performing a weekly battery inspection surveillance, Entergy personnel were unable to adjust the float voltage on 31 battery charger when the voltage was found to be lower than required by procedure, but greater than the lowest voltage allowed by TS. This issue was entered into Entergy's CAP as CR-IP3-2010-03092. At 4:18 pm, the 31 static inverter automatically transferred to its alternate power source, and subsequently auto-transferred back to its normal power supply. Entergy personnel entered this issue into the CAP as CR-IP3-2010-03098. At 9:58 pm, operators removed the 31 battery charger from service and placed the 35 battery charger, the installed spare, in service to supply power to the 31 static inverter and the 31 instrument bus while technicians performed troubleshooting for the events. Entergy personnel replaced a gate driver card, performed a load test, and on October 21, 2010, declared the 31 battery charger operable and placed it back in service.

Entergy staff completed an apparent cause evaluation (ACE) for this event on November 1, 2010, which was evaluated and approved by the Corrective Action Review Board (CARB) on December 21, 2010. In the ACE report, Entergy staff documented their determination that the 31 battery charger had been incapable of performing its safety function and classified the issue as a maintenance rule functional failure because the 31 battery charger had failed to provide reliable output voltage.

The inspectors noted that Entergy procedure EN-LI-102, "Corrective Action Process," outlines that personnel involved with the investigation and disposition of CRs are responsible for informing the Shift Manager and Licensing Manager immediately if a condition previously thought to be not reportable is in fact reportable as determined from new information found during the investigation. Additionally, the procedure requires the responsible manager to ensure that any potential operability/functionality or reportability issues identified during the resolution of a CR have been appropriately addressed prior to recommending closure of the CR. The inspectors further noted that CR-IP3-2010-03092 and CR-IP3-2010-03098 were closed with no action taken to review the past operability or reportability of the 31 battery charger after the ACE had concluded that the 31 battery charger was incapable of performing its safety function. Subsequent to the inspectors' questioning, Entergy personnel performed a past operability review and determined that the 31 battery charger was inoperable and left in service for 8 hours and 27 minutes, thus exceeding the TS AOT of two hours. Based on this review, Entergy

personnel concluded that the condition met the criteria for reporting under 10 CFR 50.73 (a)(2)(i)(B) and that a 60-day report was required to have been submitted to the NRC.

The inspectors determined that the 31 battery charger had been inoperable, yet remained in service for greater than its TS allowed outage time (AOT). The inspectors also determined that the condition met the criteria for reporting under 10 CFR 50.73(a)(2)(i)(B), in that the condition was not allowed by the plant's TS. Although the Entergy ACE team identified that the battery charger was not capable of performing its safety function, until prompted by the NRC inspectors, Entergy personnel did not evaluate whether the reportability criteria applied and thus did not identify the requirement to submit a 60-day report.

Entergy personnel entered this issue into their corrective action program as CR-IP3-2011-0092. Completed corrective actions include performing a past operability review. Planned corrective actions include submitting an LER to the NRC.

Analysis: The inspectors determined there was a performance deficiency because Entergy personnel did not provide a 60-day LER, as required by 10 CFR 50.73(a)(2)(i)(B). This violation involved a failure to make a required report to the NRC and is considered to impact the regulatory process. Such violations are dispositioned using the traditional enforcement process instead of the Significance Determination Process. Using the Enforcement Policy Section 6.9, "Inaccurate and Incomplete Information or Failure to Make a Required Report," example (d)(8), which states "A licensee fails to make a report required by 10 CFR 50.72 or 10 CFR 50.73," the NRC determined that this violation is more than minor and categorized as a Severity Level IV violation.

Because this violation involves the traditional enforcement process with no underlying technical violation that would be considered more than minor in accordance with IMC 0612, a cross-cutting aspect is not assigned to this violation.

Enforcement: 10 CFR 50.73(a)(2)(i)(B) requires licensees to submit an LER for any operation or condition which was prohibited by the plant's Technical Specifications within 60 days of discovering the event. Contrary to the above, Entergy failed to submit a report within 60 days of November 1, 2010, after Entergy concluded that the 31 battery charger had been inoperable for greater than its TS AOT. Because this violation was of very low safety significance and was entered into Entergy's corrective action program, this violation is being treated as an NCV, consistent with section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000286/2011002-02, Failure to Submit an LER for a Condition Prohibited By TS Associated With 31 Battery Charger Inoperability)**

### .3 Lifting of 32 ABFP Steam Supply Relief Valve

Introduction: A self-revealing NCV of very low safety significance (Green) of 10 CFR 50, Appendix B, Criterion XI, 'Test Control,' was identified because Entergy personnel did not establish an adequate test program to assure that the 32 ABFP steam supply relief valve would perform satisfactorily. Specifically, Entergy personnel did not ensure the 'PCV-1139 Valve and Controller Replacement' modification (Minor Modification Package

97-3-320) acceptance values for the remote setpoint pressure regulating valve MS-PR-1139-5 were incorporated into testing procedures.

Description: On February 16, 2000, the licensee accepted the completed installation of MMP 97-3-320 'PCV-1139 Valve and Controller Replacement.' This modification replaced the existing steam supply pressure control valve and the associated control system for the 32 ABFP to allow for adequate steam pressure control during starting of the 32 ABFP turbine. The modification included installation of a pneumatic remote setpoint regulator (MS-PR-1139-5) to provide a remote setpoint reference input to the PCV-1139 controller (PIC-1139). The inspectors noted that both the pre-installation testing, and the installation testing in MMP 97-3-320 specifies that the remote setpoint regulator be set to 12.50 psig +/- 0.5 psig. Additionally, the MMP 97-3-320 post installation functional testing specified that at no time during the test should the steam supply safety valve MS-52 open.

The inspectors reviewed the procedure revisions and document updates specified in MMP 97-3-320 and noted that MS-PR-1139-5 setpoint acceptance criteria were not adequately incorporated into Entergy procedures. Specifically, the 32 ABFP Steam Supply Controller Calibration procedure (3-IC-PC-I-P-1139, Rev. 0, effective date March 17, 2010) did not include steps to verify the setpoint of MS-PR-1139-5 to preclude lifting of the MS-52 steam supply relief valve when not warranted.

On October 29, 2010, the PCV-1139 controller was replaced and calibrated using 32 ABFP Steam Supply Controller Calibration procedure. While the pump passed the post maintenance surveillance test, the calibration procedure did not verify the pneumatic setpoint was maintained within the acceptance band to support pump operation. Subsequently, on January 21, 2011, during the performance of the 32 ABFP Surveillance and IST (3-PT-Q120B), PCV-1139 did not maintain pressure within the normal band during turbine startup and allowed steam supply pressure to increase to within the MS-52 steam supply relief valve setpoint (700 +/- 21 psig). As a result, the relief valve repeatedly lifted causing the test to be prematurely terminated and the 32 ABFP to be declared inoperable by Entergy operators. Further, Entergy investigation revealed an as-found MS-PR-1139-5 setpoint value of 13.03 psig, which corresponds to a steam supply pressure of approximately 690 psig.

Entergy personnel entered this issue into their CAP as CR-IP3-2011-00232. Completed corrective actions include performing a higher-tier apparent cause evaluation, and performing a past operability evaluation on the 32 ABFP. Planned corrective actions include updating applicable equipment parameters from MMP 97-3-320 in the Entergy equipment database; reviewing the results of 3PT-R166, 32 ABFP Steam Relief Valve MS-52, to assess the potential for MS-52 drift; and revision of 3-IC-PC-I-P-1139 to correct drawing discrepancies and ensure that the calibration procedure maintains control of the proper setpoint for MS-PR-1139-5.

Analysis: The inspectors identified a performance deficiency in that Entergy personnel did not properly incorporate into procedures the requirements of the 'PCV-1139 Valve and Controller Replacement' modification that included acceptance values for the remote setpoint pressure regulating valve MS-PR-1139-5. The inspectors determined the finding is more than minor because the finding is associated with the Design Control

attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, during the performance of 3-PT-120B on January 21, 2011, PCV-1139 did not maintain pressure in the normal band on startup and allowed pressure to increase to a level that allowed the steam supply relief valve, MS-52, to repeatedly lift, causing unanticipated unavailability and the 32 ABFP to be declared inoperable. The inspectors evaluated the finding in accordance with IMC 0609, Attachment 4, 'Phase 1 – Initial Screening and Characterization of Findings,' and determined it was of very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and was not risk significant with respect to external initiating events.

The inspectors determined that this finding had a cross-cutting aspect in the resources program area of Human Performance because Entergy personnel did not ensure that complete, accurate and up-to-date design documentation, procedures, and work packages, and correct labeling of components were available to assure nuclear safety. Specifically, Entergy personnel did not properly incorporate into procedures the requirements of MMP 97-3-320, which included acceptance values for the remote setpoint pressure regulating valve MS-PR-1139-5. (H.3(b) per IMC 0310)

Enforcement: 10 CFR, Appendix B, Criterion XI, 'Test Control,' requires, in part, that a test program be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents.

Contrary to the above, on March 17, 2010, Entergy personnel did not properly incorporate into the 32 ABFP Steam Supply Controller Calibration procedure the requirements of the 'PCV-1139 Valve and Controller Replacement' modification. This resulted in the repeated lifting of steam supply relief valve MS-52 on January 21, 2011 and the inoperability of the 32 ABFP. Because this violation was of very low safety significance and was entered into Entergy's corrective action program, this violation is being treated as an NCV, consistent with section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000286/2011002-03, Lifting of 32 ABFP Steam Supply Relief Valve)**

.4 Inappropriate Application of Sealant Resulted in Drain Blockage for the Turbine-Driven Auxiliary Feedwater Pump

Introduction: The inspectors identified a NCV of very low safety significance (Green) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Entergy personnel did not identify and correct a condition adverse to quality with regard to packing leakoff reservoir drain line blockage for the 32 ABFP which likely existed for some timeframe between October 2010 and January 2011. Specifically, Entergy personnel did not identify and correct inappropriate application of sealant coupled with drain line blockage that resulted in inadequate drainage of the leakoff reservoir associated with the 32 ABFP. This condition most likely resulted in water intrusion into the pump's outboard bearing housing in January 2011.

Description: On January 21, 2011, during quarterly surveillance testing of the 32 ABFP, Entergy operators observed a water/oil mixture in the outboard pump bearing constant level oiler, followed by the unrelated lifting of the steam supply relief valve for the steam turbine (See Section 1R15.2) that prompted Entergy operators to shutdown the pump during surveillance testing.

Entergy staff initiated condition report (CR) IP3-2011-00232 and evaluated the potential causes of the oil/water condition utilizing barrier analysis methodology to inform decision-making during troubleshooting, which initially considered the potential causes to be related to a bearing housing cooler leak, water migration along the shaft, moisture condensation, and the potential for the fill of contaminated oil during oil changes. Entergy personnel also performed chemical analysis of the water to determine potential sources of the water. Following the troubleshooting process and early causal evaluations, Entergy staff ruled out the initial causes through direct observations from operators and other personnel present during the testing, as well as engineering judgment based on identified pump parameters and through hydrostatic testing of the outboard bearing housing to validate the integrity of the integral bearing water cooler. Entergy staff drained, flushed, and refilled the oil reservoir portion of the housing. They determined through testing and cumulative analysis of available information from sampling and draining evolutions the existence of approximately 52% water by volume in the outboard bearing housing. Entergy personnel subsequently re-tested the pump successfully and returned the pump to operable status on January 22, 2011.

In follow-up to this issue, the inspectors observed sealant had been applied to what was later determined to be a gap between the packing leak-off reservoir bowl and a stand pipe beneath the bowl. The gap would ensure normal packing leak-off water is directed away from the bearing housing in the event the drain pipe was blocked. The inspectors questioned whether Entergy's evaluation considered the sealant application as a potential contributor to the water intrusion into the bearing housing. Entergy personnel subsequently determined the sealant had been applied in accordance with work management instructions (work order IP3-03-03483) in 2003, and documented in the corrective action program as CR-IP3-2003-3815. The inspectors noted that this application of sealant was originally intended to be a temporary measure and was to be further evaluated for longer term corrective actions and application. The inspectors also noted that a similar occurrence associated with the Unit 2 steam-driven ABFP resulted in a design modification to ensure appropriate orientation of the drain pipe to mitigate effects from drain pipe blockage. The inspectors identified that the temporary installation of the sealant was not evaluated further and the condition report was closed. As a result, this temporary measure was maintained in place for several years, essentially a design change to the 32 ABFP outboard packing gland leakoff reservoir drain configuration until October 2010.

In October 2010, Entergy personnel identified (CR-IP3-2010-3316) that water was leaking approximately 20 drops per minute from the "mechanical joint" between the pump leakoff reservoir and the drain piping. Entergy personnel determined the pump was operable and the CR was closed to the work management system (under WO 255324). This WO, while updated with information from the CR that stated the issue appeared to be a recurring problem based on the buildup of sealing compound on the mechanical joint, was not implemented prior to the January 21, 2011 surveillance testing

of the pump. The inspectors determined that this was a missed opportunity by Entergy personnel to identify the inadequate application of sealant as well as the blockage that was likely present in some form to cause water to leak out around the sealant and cause its discovery. The inspectors also determined it was reasonable for operator rounds and engineering walkdowns commonly completed in this area to have identified this adverse condition.

The inspectors noted that following NRC discussions and observations, Entergy personnel subsequently (1) revised the original operator special log to include the additional requirement of verifying the proper draining of the leakoff reservoirs during operator rounds, and (2) removed the sealing compound from the area between the leakoff reservoir and the drain piping. As a result, Entergy personnel identified there was no mechanical joint at the juncture of the packing leakoff reservoir casing and the drain piping. Moreover, based on a modification performed in 2002 on the Unit 2 turbine-driven ABFP, Entergy personnel determined that a gap was required to ensure any drain line blockage would preclude the backup of the packing leakoff water, the subsequent overflow of the reservoir, and the potential for water to enter the bearing housing along the shaft and contaminate the oil.

Entergy personnel conducted a high level apparent cause evaluation (CR-IP3-2011-00232). Entergy personnel also completed a past operability evaluation that concluded the turbine-driven ABFP would have been able to perform its safety-related design function for its designated mission time. Entergy personnel supported that conclusion with results from vendor pump testing that supported long-term operation of pumps with similar bearings under similar water/oil mixture conditions, and discussions with the bearing manufacturer. Additionally, during the refueling outage in March 2011, the pump outboard thrust bearing was inspected by Entergy staff which indicated satisfactory condition of the thrust bearing and its ability to support pump operability for its required design basis mission time. The inspectors concluded Entergy staff's evaluation was adequate to support their conclusion of past and continued operability with regard to the 32 ABFP.

Analysis: The inspectors determined Entergy personnel did not properly identify and correct a condition adverse to quality with regard to packing leakoff reservoir drain line blockage for the 32 ABFP. The issue was determined to be more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected its objective of ensuring the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the water intrusion in the bearing housing as a result of the performance issue could adversely impact the bearing cooling function of the pump and long-term pump operation.

The inspectors evaluated the finding in accordance with IMC 0612, Appendix B, "Issue Screening," and performed a significance evaluation in accordance with Table 4a of IMC 0609, Attachment 4, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors concluded that the water intrusion in the 32 ABFP pump outboard bearing housing, while it caused unanticipated unavailability, did not result in a loss of operability of the 32 ABFP, did not result in the actual loss of a safety function and it was not risk significant with respect to external initiating events.

Therefore, the inspections determined this issue is of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution associated with the attribute of the corrective action program because Entergy personnel did not thoroughly identify and correct drain line blockage indications for the turbine-driven ABFP. (P.1(a) per IMC 0310)

**Enforcement:** 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to ensure that conditions adverse to quality are identified and corrected. Contrary to these requirements, Entergy personnel did not identify and correct in a timely manner a condition adverse to quality with regard the packing leakoff reservoir drain line blockage for the 32 ABFP which existed for some timeframe between October 2010 and January 2011, and was the most likely cause of water intrusion into the outboard bearing housing of the 32 ABFP. Because this violation was of very low safety significance and was entered into Entergy's corrective action program as CR-IP3-2011-00232, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000286/2011002-04, Inappropriate Installation of Sealant Resulted in Drain Blockage for the Turbine-Driven Auxiliary Feedwater Pump)**

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Permanent Modification: EC-8648, Installation of New Jacket Water Pressure Switches on the 31 emergency diesel generator, JWPS-1/2

a. Inspection Scope

The inspectors reviewed applicable design documentation associated with the installation of replacement jacket water pressure switches for the 31 emergency diesel generator (EDG), performed under engineering change EC-8889. This change was required due to previously identified deficiencies with the existing pressure switches, PS-2260 and PS-2262, and the susceptibility to prevent completion of specific portions of the EDG start sequence, in particular, the air start system, upon demand. This degradation was previously documented in NRC IR 2009-005, issued in February 2010. The inspectors verified the adequacy of the modification to ensure consistency with the applicable design requirements, associated calculations, procedures, and drawings. This verification included attributes, such as engineering design change program requirements and 10 CFR 50.59 screening, to ensure that the EDG would continue to perform applicable design functions with the newly installed switches.

During implementation of the modification, the inspectors verified that appropriate configuration and testing controls were utilized, which included lockout/tagout requirements, pressure switch material changes, structural and seismic requirements, and other design change interface requirements. Following implementation, a post-modification test was conducted on January 27, 2011, and the inspectors verified that testing criteria were adequate and appropriate for the circumstances, and that acceptable results were obtained. Additionally, the inspectors verified that applicable surveillance test procedures and drawings were captured under the design interface



process to ensure consistency with the requirements of the modification and the associated EDG design and licensing bases.

b. Findings

No findings were identified.

.2 Temporary Modification: Installation of a Temporary Leak Repair Clamp on Service Water Piping Downstream of SWN-6.

a. Inspection Scope

The inspectors reviewed applicable design documentation associated with the installation of a temporary clamp on service water piping downstream of SWN-6, to mitigate the impacts of a leak that was identified on February 22, 2011. The inspectors evaluated the engineering change, performed under EC-27849, to ensure appropriate structural integrity was maintained for the applicable piping section with the addition of the temporary clamp. The inspectors verified the adequacy of the modification to ensure consistency with the applicable piping code design requirements, and associated calculations, procedures, and drawings. This verification included attributes, such as engineering design change program requirements, as well as associated 10 CFR 50.59 screening.

Following implementation of the modification, the inspectors verified that appropriate configuration controls were utilized, which included a review of lockout/tagout requirements that were utilized during implementation. Additionally, the inspectors verified that the modification, i.e., the clamp installation, was appropriate for the specific application, and that structural and seismic requirements were satisfied, as necessary. Following implementation, the inspectors verified that post-modification testing criteria were adequate and that acceptable results were obtained.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)

a. Inspection Scope

The inspectors reviewed post-maintenance test procedures and associated testing activities for selected risk-significant mitigating systems, and assessed whether the effect of maintenance on plant systems was adequately addressed by control room and engineering personnel. The inspectors verified that: test acceptance criteria were clear and the test demonstrated operational readiness consistent with design basis documentation; test instrumentation had current calibrations with the appropriate range and accuracy for the application; and the tests were performed as written, with applicable prerequisites satisfied. Upon completion of the tests, the inspectors reviewed whether equipment was returned to the proper alignment necessary to perform its safety function. Post-maintenance testing was evaluated for conformance against the

requirements of 10 CFR 50, Appendix B, Criterion XI, "Test Control." The documents reviewed are listed in the Attachment. The following post-maintenance activities were reviewed and represented seven inspection samples:

- 33 service water pump discharge check valve repair on January 15, 2011;
- 33 battery charger troubleshoot repair on January 19, 2011;
- 32 ABFP troubleshoot repair on January 22, 2011;
- 31 EDG maintenance outage on January 25, 2011;
- 35 battery charger troubleshoot and repair on February 3, 2011;
- 3-PT-R007A, 31 ABFP full flow test on March 7, 2011; and
- 32 RHR pump breaker failed to operate on March 26, 2011.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

Refueling Outage No. 16 (3R16)

a. Inspection Scope

The inspectors observed and/or evaluated the selected outage activities listed below to verify that (1) shutdown risk was considered during schedule preparation and implementation, and high risk significant evolutions such as reduced inventory conditions; (2) defense-in-depth (DID) measures were utilized to mitigate impacts on key safety functions (e.g., reactivity control, electrical power availability, containment integrity, etc.) due to plant configuration control changes, and ensured compliance with technical specifications and the operating license throughout the outage period; and (3) risk significant activities were conducted in accordance with procedures and evaluated in a manner appropriate for the circumstances.

- Plant shutdown and transition to operational Mode 5, including residual heat removal startup and cooldown activities;
- Initial vapor containment (VC) and post-shutdown boric acid inspection inside the vapor containment to assess effectiveness of unidentified leakage monitoring and compliance with TS;
- VC sump vortex suppressor modification and inspection;
- Refueling activities, including fuel movements/shuffle;
- Reactor vessel head lift (heavy load);
- Reactor coolant system (RCS) initial drain down on March 11 – 12, 2011, to verify procedural compliance, and operability and functionality of the redundant and diverse reactor coolant system level instrumentation;
- Changes in daily plant risk and implementation of DID measures;
- A sample of lockout/tagouts and clearances, were reviewed to verify appropriate controls of plant configuration changes were being implemented for the protection of plant equipment and personnel;

- Open outage constraints (work orders and condition reports) were reviewed to verify appropriate disposition of issues, both technical and /or administratively, to ensure compliance with procedural and/or TS requirements;
- Vapor containment closure team DID measures (DID-C4) and contingency implementation, team make-up, briefings, and inspection of staged tools; and
- Evaluated boration flowpath activities to ensure appropriate reactivity controls and makeup capabilities were available.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 7 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components, to assess whether test results satisfied Technical Specifications, UFSAR, technical requirements manual, and Entergy procedure requirements. The inspectors verified that: test acceptance criteria were sufficiently clear; tests demonstrated operational readiness and were consistent with design basis documentation; test instrumentation had accurate calibrations and appropriate range and accuracy for the application; tests were performed as written; and applicable test prerequisites were satisfied. Following the tests, the inspectors verified whether equipment was capable of performing the required safety functions. The documents reviewed during this inspection are listed in the Attachment. The following surveillance tests were reviewed and represented seven inspection samples, which included an inservice testing (IST) surveillance:

- 3-PT-Q101, MS valves PCV-13104, PCV-1310A, and PCV-1139 stroke test (IST) on January 21, 2011;
- 3-PT-Q3B, R-5 functional test on February, 1, 2011;
- 3-SOP-RPC-006A, thermal power calculation, on February 8, 2011;
- 3-PT-Q120C on February 17, 2011;
- 3-PT-V032S, Inservice Pressure Test of Service Water System Outside VC, Rev. 1, on February 28, 2011;
- 3-SOP-RC-001, Rod Position Indication verification on March 1, 2011; and
- 3-PT-V032T, Pressure Decay test of Underground Condensate Piping, Rev. 1, on March 16, 2011.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

### Cornerstone: Occupational/Public Radiation Safety (PS)

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

##### a. Inspection Scope

##### Radiological Hazard Assessment

The inspectors reviewed any changes to plant operations that may result in a significant new radiological hazard for onsite workers or members of the public since the last inspection. The inspectors verified that the licensee has assessed the potential impact of these changes and has implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

Recent radiological surveys from more than six plant areas were reviewed by the inspectors to evaluate the thoroughness and frequency of the surveys and that they were appropriate based on the radiological hazards.

The inspectors conducted walkdowns and performed independent radiation surveys of the facility, including radioactive waste processing, storage, handling areas; and inside the Unit 3 containment, primary auxiliary building and spent fuel storage building, to evaluate the existing radiological conditions and the efficacy of the associated radiological postings and controls.

The inspectors observed and evaluated the following radiological risk-significant work activities:

- Bullet nose repositioning on the Unit 3 reactor upper internals;
- Unit 3 reactor head shielding and established access controls;
- No. 32 reactor coolant pump seal replacement;
- Unit 3 reactor defueling activities; and
- Unit 3 spent fuel building fuel movement.

With respect to the above work activities, the inspectors verified that appropriate pre-work surveys were performed and were sufficient to identify and quantify the radiological hazards and to establish adequate protective measures. In addition, the inspectors reviewed applicable radiological surveys associated with these work activities to determine if hazards were properly identified, including the following: identification of hot particles, the presence of alpha emitters, the potential for airborne radioactive materials, the hazards associated with work activities that could negatively affect the radiological conditions, and any significant radiation field dose gradients that could result in non-uniform exposures of the body.

The inspectors selected at least five air sample survey records during refueling outage conditions and verified that the samples were collected and counted in accordance with licensee procedures. The inspectors observed work in potential airborne areas to evaluate if applicable air monitoring was representative of the breathing air zone of the

workers. The inspectors also reviewed the use of continuous air monitors (CAMs) to monitor real-time airborne conditions in accordance with Entergy procedures. The inspectors verified that the licensee's program for monitoring loose surface contamination in areas of the plant was adequate to assess the potential for airborne contamination conditions.

#### Instructions to Workers

The inspectors observed various radioactive material containers and verified that they were labeled and controlled in accordance with 10 CFR Part 20 requirements.

Radiation work permits (RWPs) associated with the radiological risk-significant work activities listed above, were evaluated by the inspectors to identify what work control instructions or control barriers were specified and that plant-specific TS high radiation area requirements were met, including the use of applicable electronic pocket dosimeter (EPD) alarm setpoints that were specified in conformance with survey indications and plant policy.

The inspectors reviewed one electronic personal dosimeter dose rate alarm occurrence that was documented in a condition report. The inspectors verified that Entergy responded appropriately to the occurrence and that corrective actions and dose evaluations were adequate.

#### Contamination and Radioactive Material Control

The inspectors conducted observations at the Unit 2 and Unit 3 radiological controlled area (RCA) egress locations to observe the performance of personnel surveying and releasing material for unrestricted use to verify that those activities were performed in accordance with plant procedures and the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site.

The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material and verified that the radiation detection instrumentation was being used at its most effective sensitivity capability.

#### Radiological Hazards Control and Work Coverage

During tours of the facility and review of the work activities listed above, the inspectors evaluated the ambient radiological conditions and verified that existing conditions were consistent with posted surveys, RWPs, and worker briefings, as applicable.

During these work activity performance observations, the inspectors verified the adequacy of radiological controls, such as required surveys (including system breach radiation, contamination, and airborne surveys), radiation protection job coverage (including audio and visual surveillance for remote job coverage), contamination controls, and the licensee's means of using EPDs in high noise areas as high radiation area (HRA) monitoring devices.

The inspectors verified that radiation monitoring devices were placed on the individual's body appropriately to monitor dose from external radiation sources. This review included high-radiation work areas with significant dose rate gradients.

The inspectors reviewed five RWPs for work within potential airborne radioactivity areas with the potential for individual worker internal exposures. The inspectors evaluated the airborne radioactivity controls and monitoring, including potentials for significant airborne radioactivity levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, reactor cavities). For these selected potential airborne radioactive areas, the inspectors verified the appropriate use of high-efficiency particulate air (HEPA) ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within the Unit 2 and Unit 3 spent fuel pools and verified that appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

Tours within the RCA of Units 2 and 3 were conducted by the inspectors to evaluate radiological postings and physical controls for HRAs and very high radiation areas (VHRAs) with respect to regulatory requirements.

#### Risk-Significant High Radiation Area and Very High Radiation Area Controls

The inspectors discussed with the Radiation Protection Manager and a first-line health physics supervisor, the controls and procedures for high-risk HRAs and VHRAs and actions to be taken during changing plant conditions.

#### Radiation Worker Performance

During observation of the work activities listed above, the inspectors observed radiation worker performance with respect to applicable radiation protection work requirements to determine if workers were aware of the significant radiological conditions in their workplace and their work performance was within the RWP control/limit requirements specified for the work performed.

The inspectors reviewed several radiological problem reports since the last inspection that identified the cause of the event to be human performance errors to determine if there was an observable pattern traceable to a similar cause and if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

#### Radiation Protection Technician Proficiency

During observation of the work activities listed above, the inspectors evaluated the performance of radiation protection technicians with respect to radiation protection work requirements and determined if technicians were aware of the radiological conditions in their workplace and the RWP controls/limits and if their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed several radiological problem reports since the last inspection that identified the cause of the event to be radiation protection technician error to determine if there was an observable pattern traceable to a similar cause and if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

#### Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee CAP.

#### b. Findings

No findings were identified.

### 2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

#### a. Inspection Scope

##### Inspection Planning

The inspectors reviewed the plant final safety analysis report (FSAR) to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation and a description of the respiratory protection program to include the location and quantity of respiratory protection devices stored for emergency use.

The inspectors reviewed the reported performance indicators (PIs) to identify any related to unintended dose resulting from intakes of radioactive materials.

##### Engineering Controls

During observation of the work activities listed in section 2RS1 of this report, the inspectors verified the licensee's use of ventilation systems as part of its engineering controls (in lieu of respiratory protection devices) to control airborne radioactivity. In addition the inspectors reviewed the ventilation controls for the Unit 3 spent fuel storage building and Unit 3 containment during refueling conditions.

The inspectors evaluated several temporary HEPA ventilation systems used to support work in contaminated areas and verified that the use of these systems was consistent with licensee procedural guidance and as low as is reasonably achievable (ALARA).

The inspectors observed the use of several CAMs within the RCA that were being used to monitor and warn personnel of changing airborne concentrations in the plant. The inspectors verified that alarms and setpoints were sufficient to prompt licensee/worker action to ensure that doses are maintained within the limits of 10 CFR Part 20 and ALARA.

### Use of Respiratory Protection Devices

During observation of the work activities listed in section 2RS1 of this report, the inspectors reviewed the use of respiratory protection devices and the use of engineering controls to limit the overall exposure of the workers. The inspectors verified that the respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration. The inspectors reviewed the respiratory protection qualification records of three respirator users to verify that these individuals were medically certified, fit tested and appropriately trained in the respirators that had been used. During work activity observations, the inspectors assessed the workers use of respiratory protection devices in the field.

The inspectors verified respiratory protection equipment storage and controls for the equipment staged and ready for use in the plant and stocked for issuance. The inspectors observed the physical condition of the equipment and applicable maintenance and inspection records for selected equipment that was ready for use.

### Problem Identification and Resolution

The inspectors verified that problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee CAP and that the corrective actions were appropriate commensurate with the safety significance of the issues.

#### b. Findings

No findings were identified.

### 2RS4 Occupational Dose Assessment (71124.04 – 1 sample)

#### a. Inspection Scope

##### Inspection Planning

The inspectors reviewed the results of radiation protection program audits related to internal and external dosimetry (i.e., licensee's quality assurance (QA) audit).

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) report on the vendor's most recent results to determine the status of the vendor's external dosimetry program.

The licensee's procedures associated with dosimetry operations and dose evaluations were reviewed and verified that the licensee has established procedural requirements for determining when external and internal dosimetry is required.



## External Dosimetry

### NVLAP Accreditation

The inspectors verified that the licensee's personnel dosimeters that require processing are NVLAP accredited. This review included the approved irradiation test categories for the type of personnel dosimeter used [optically stimulated luminescent (OSL)] that are consistent with the types and energies of the radiation present, and use of the dosimeters [e.g., to measure deep dose equivalent, shallow dose equivalent, and lens dose equivalent].

### Passive Dosimeters (OSL)

The onsite storage of personnel dosimeters was evaluated by the inspectors to verify the appropriate background exposure monitoring of dosimeters was accounted for when not in use.

### Active Dosimeters (Electronic Dosimeters)

The inspectors reviewed the licensee's use of a "correction factor" to address the response of the electronic dosimeter (ED) as compared to OSL for situations when the ED must be used to assign dose.

## Internal Dosimetry

### Routine Bioassay (in vivo)

The licensee's use of passive monitoring using portal monitors for screening intakes was reviewed for adequacy to detect internally deposited radionuclides.

Positive whole body count records for 2010 were reviewed and verified that no detectable internal dose assessments were determined above 10 mrem.

### Special Bioassay (in vitro)

During 2010, there were no internal dose assessments requiring in vitro monitoring for inspection review.

The inspectors reviewed and assessed the adequacy of the licensee's program for dose assessments based on airborne/derived airborne concentration (DAC) monitoring. This review verified that flow rates and/or collection times for fixed head air samplers or lapel breathing zone air samplers were adequate to ensure that appropriate lower limits of detection are obtained. The inspectors reviewed the adequacy of procedural guidance used to assess dose when, if using respiratory protection, the licensee applies protection factors. There were no dose assessments that used airborne/DAC monitoring for 2010 to review.

## Special Dosimetric Situations

### Declared Pregnant Workers

The inspectors verified that the licensee informs workers of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

There was one individual who declared their pregnancy during the current assessment period, and their exposure monitoring records and the licensee's program for limiting exposure for the declared pregnant worker were reviewed with respect to the requirements of 10 CFR Part 20.

### Dosimeter Placement and Assessment of Effective Dose Equivalent for External Exposures

The inspectors reviewed the adequacy of the licensee's methodology for monitoring external dose in situations in which non-uniform fields are expected or large dose gradients will exist (e.g., diving activities and steam generator jumps) to include criteria for determining dosimetry placement or the use of multi-badging.

### Shallow Dose Equivalent

During 2010, there were no shallow dose equivalent dose assessments for inspection review.

### Neutron Dose Assessment

The inspectors reviewed the licensee's neutron dosimetry program, including dosimeter type(s) and/or neutron survey instrumentation.

### Problem Identification and Resolution

The inspectors verified that problems associated with occupational dose assessment are being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee CAP.

#### b. Findings

No findings were identified.

## 2RS5 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

#### a. Inspection Scope

##### Inspection Planning

The inspectors reviewed the plant UFSAR to identify radiation instruments associated with monitoring plant radiological conditions including airborne radioactivity, process

streams, effluents, materials/articles, workers, and post-accident monitoring, including those instruments used for emergency assessment.

The inspectors reviewed a Quality Assurance audit that included the licensee's onsite calibration facility.

The inspectors reviewed procedures specifying the methodology for performing instrument source checks and calibrations.

#### Walkdowns and Observations

Walkdowns of five effluent radiation monitoring systems (including liquid and airborne monitoring) were performed by the inspector. The inspectors verified the material condition of the radiation monitoring systems and verified that effluent/process monitor configurations were aligned in accordance with offsite dose calculation manual (ODCM) and FSAR descriptions.

The inspectors selected 10 portable survey instruments; five area radiation monitors and continuous air monitors; and four personnel contamination monitors, which were in use or available for issuance. Calibration records for the selected instruments were reviewed as well as currency of source checks, and instrument operability.

#### Calibration and Testing Program

##### Process and Effluent Monitors

The inspectors selected five effluent monitor instruments (including both liquid and gaseous monitors) and verified calibration and functional tests were performed consistent with radiological effluent technical specifications/ODCM and that the licensee calibrates its monitors with a transfer standard instrument that is traceable to National Institute of Standards and Technology (NIST). In addition, the inspectors verified that the selected effluent monitor alarm setpoints were established as provided in the ODCM and station procedures.

##### Laboratory Instrumentation

The inspectors selected one of each type of laboratory analytical instrument used for radiological analyses (e.g., gross alpha, gross beta, proportional counters, gamma spectroscopy and liquid scintillation counters) and verified that daily performance checks and calibration data indicate that the frequency of the calibrations is adequate and there are no indications of degraded instrument performance.

##### Whole Body Counter

Recent Whole body counter calibration and functional check records were reviewed by the inspector.

### Post-accident Monitoring Instrumentation

The inspectors selected the containment high-range monitors for both Units 2 and 3 and reviewed the calibration documentation since the last inspection for adequacy.

### Contamination Monitors

In-service personnel contamination monitors and small article monitors located in the Unit 2 and Unit 3 radiological controlled area egress point were selected to verify current calibration records and to verify that the alarm setpoint values are reasonable to ensure that licensed material is not released from the site.

### Portable Survey Instruments, Area Radiation Monitors (ARMs), Electronic Dosimetry, and Air Samplers/CAMs

The inspectors reviewed calibration documentation for at least one of each type of instrument. For portable survey instruments and ARMs, the inspectors reviewed detector measurement geometry and calibration methods for each, which included the use of its instrument calibrators.

During review of calibration records of portable survey instruments, the inspectors screened any as-found calibration results and corresponding licensee actions for instruments found significantly out of calibration (greater than 50 percent).

### Instrument Calibrator

The inspectors reviewed the basis for instrument calibrations and that the instrument calibrators used were calibrated using calibration transfer instruments traceable to the NIST.

### Calibration and Check Sources

The inspectors reviewed the licensee's 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," source term to determine if the calibration sources used were representative of the types and energies of radiation encountered in the plant.

### Problem Identification and Resolution

As documented in Section 4OA2 of this report, the inspectors verified that problems associated with radiation monitoring instrumentation are being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee CAP.

#### b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151 – 3 samples)

###### a. Inspection Scope

The inspectors reviewed PI data listed below to verify the accuracy of the data recorded from January 2010 through December 2010. The inspectors used Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," as applicable, and reviewed associated Entergy procedures and data to verify individual PI accuracy and completeness. The documents reviewed during this inspection are listed in the Attachment.

###### Initiating Events Cornerstone

- Unplanned Scrams per 7000 Critical Hours;
- Unplanned Power Changes per 7000 Critical Hours; and
- Unplanned Scrams with Complications.

###### b. Findings

No findings were identified.

##### 4OA2 Identification and Resolution of Problems (71152)

###### .1 Routine Problem Identification and Resolution Program Review

###### a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and to identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of all items entered into Entergy's CAP. The review was accomplished by accessing Entergy's computerized database for CRs and attending condition report screening meetings.

In accordance with the baseline inspection modules, the inspectors selected CAP items across the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for further follow-up and review. The inspectors assessed Entergy personnel's threshold for problem identification, the adequacy of the causal analysis, extent of condition reviews, operability determinations, and the timeliness of the associated corrective actions.

###### b. Findings

No findings were identified.

.2 Radiation Safety Cornerstone (71124.01)

a. Inspection Scope

The inspectors reviewed one corrective action condition report (CR-IP2-2010-7316) that was initiated between December 1, 2010 and January 10, 2011 that was associated with the radiation protection program. The inspectors verified that problems identified by this condition report was properly characterized in the licensee's event reporting system, and that applicable causes and corrective actions were identified commensurate with the safety significance of the radiological occurrence.

The inspectors reviewed eight corrective action condition reports initiated between January and March 2011 that were associated with the radiation protection program. The inspectors verified that problems identified by this condition report were properly characterized in the Entergy event reporting system, and that applicable causes and corrective actions were identified commensurate with the safety significance of the radiological occurrence.

b. Findings

No findings were identified.

.3 Inservice Inspection (ISI) (71111.08)

a. Inspection Scope

The inspectors reviewed a sample of corrective action reports (CR), listed in Attachment 2, which involved in-service inspection related activities, to ensure that nonconformances are being promptly identified, reported and resolved.

b. Findings

No findings were identified.

4OA3 Event Follow-Up (71153 – 2 samples)

.1 Technical Specification Required Shutdown on February 22, 2011, Due to Service Water Piping Leak and Loss of Safety Function

a. Inspection Scope

The inspectors evaluated the response of control room personnel after operators identified a service water leak downstream of valve SWN-6. The leak resulted in a loss of safety function and an associated Technical Specification 3.0.3 required plant shutdown from Mode 1 to Mode 4. The inspectors verified that the appropriate TS action statements were entered after the discovery of the leak and that the TS required timeline for mode changes was met. The inspectors observed the plant shutdown from the control room, conducted walk-downs of safety-related equipment following the shutdown, reviewed plant computer data, evaluated plant parameter traces to verify that

plant equipment responded, as expected, and ensured that operating procedures were appropriately implemented. The inspectors reviewed the structural and seismic evaluations for the service water piping, and verified that appropriate corrective actions for leak repair were completed or planned prior to restart. The inspectors observed portions of plant heat-up and the reactor start-up, including criticality, from the control room on February 24, 2011. This event was entered into Entergy's corrective action program as CR-IP3-2011-00680.

b. Findings

No findings were identified.

The inspectors determined that the operational response to the identified service water leak was appropriate. The inspectors will conduct future reviews of the root cause evaluation (RCE) and associated corrective actions. These reviews will be conducted following Entergy's submittal of an LER for this event.

.2 RCS Leak

a. Inspection Scope

At 2100 hours on March 3, 2011, Entergy personnel entered the RCS leak procedure, 3-AOP-LEAK-1, due to identification of lowering level in the volume control tank, in excess of the technical specification (TS) unidentified leak rate limit of 1.0 gpm, which was originally estimated at 2.2 gpm.

The inspectors evaluated control room operator response, which included procedure compliance and evaluation of applicable TS, as well as supplemental actions taken to identify and isolate the leak. The inspectors noted that control room operators effectively isolated the leak in accordance with applicable procedures at 2214 hours, which was later determined to be valve leak-by from the 31 mixed bed demineralizer to the spent resin storage tank caused by a loosened reach-rod extension collar.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 (Closed) Temporary Instruction 2515/179, "Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)"

a. Inspection Scope

The inspectors verified the information listed on the licensee's inventory record by performing a physical inventory at the licensee's facility and visually identified each item listed on the licensee's inventory. The inspectors verified the presence of the nationally

tracked sources with an appropriate radiation survey instrument. During the physical inventory, the inspectors examined the physical condition of the shield devices containing nationally tracked sources, and evaluated the effectiveness of the licensee's procedures for secure storage and handling of nationally tracked sources. The inspectors also verified that appropriate leak tests had been performed and determined that the posting and labeling of nationally tracked sources were adequate.

There had been no transfers or receipts of the national source tracking system (NSTS) tracked sources from the licensee's NSTS inventory since initial registration.

The inspectors reviewed the administrative information listed in the NSTS inventory for the Indian Point Unit 3 and Unit 1 to ensure that the information was up to date. This information includes, but is not limited to:

- Mailing address;
- Physical or shipping address (for transmitting information via non-postal methods that cannot use a post office box);
- Telephone number, FAX number, and e-mail address for primary technical point of contact;
- Telephone number, fax number, and e-mail address for primary management point of contact; and
- The license numbers of NRC licenses that authorize the possession of nationally tracked source(s).

b. Findings

No findings were identified.

.2 Institute of Nuclear Power Operations (INPO) Plant Assessment Report Review

a. Inspection Scope

The inspectors reviewed the October 2009 final report for the INPO plant assessment of the Indian Point Nuclear Generating Station. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC's perspectives of licensee performance and to identify significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On March 24, 2011, the inspectors presented the ISI inspection results to Mr. Joseph Pollock, Indian Point Site Vice President, and other members of the Entergy staff at the conclusion of the inspection at an exit meeting at Indian Point Unit 3, and with Mr. Tom Orlando, IPEC Engineering Director, during a re-exit telephone conference on April 7,



2011. The licensee acknowledged the conclusions and observations presented. Any proprietary information reviewed during this inspection was properly dispositioned. No proprietary information is contained in this report.

On April 18, 2011, the inspectors presented the inspection results of the integrated inspection to Mr. Joseph Pollock, Site Vice President, and other members of the Entergy staff. The licensee acknowledged the conclusions and observations presented. The inspectors asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT****Entergy Personnel**

J. Pollock	Site Vice President
B. Allen	Engineering
H. Anderson	Licensing Specialist
V. Andreozzi	Systems Engineering Supervisor
N. Azevedo	Engineering Programs Manager
R. Burroni	Systems Engineering Manager
G. Dahl	Licensing Specialist
J. Dinelli	Site Operations Manager
B. Dolansky	ISI Program Manager
M. Dreis	System Engineer
D. Morales	System Engineer
T. Orlando	Engineering Director
M. Rose	Engineering
A. Singer	Training Superintendent
M. Tesoriero	Programs and Components Engineering Manager
A. Vitale	General Manager, Plant Operations
B. Walpole	Licensing Manager
W. Wittich	Engineering
V. Meyers	Design Engineering Supervisor

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**Opened and Closed

05000286/2011002-01	NCV	Entergy Personnel Did Not Evaluate and Monitor a Thermal Barrier Boric Acid Leak (Section 1R08)
05000286/2011002-02	NCV	Failure to Submit an LER for a Condition Prohibited By TS Associated With 31 Battery Charger Inoperability (Section 1R15.2)
05000286/2011002-03	NCV	Lifting of 32 ABFP Steam Supply Relief Valve (Section 1R15.3)
05000286/2011002-04	NCV	Inadequate Application of Sealant Resulted in Drain Blockage for the Turbine-Driven Auxiliary Feedwater Pump (Section 1R15.4)

**LIST OF DOCUMENTS REVIEWED****Section 1R04: Equipment Alignment**Procedures

3-COL-EL-005, Diesel Generators, Rev 34

3-COL-RW-002, Service Water System, Rev 43

Condition Reports (CR-IP3-)

2011-01545

**Section 1R05: Fire Protection**Procedures

PFP-301, U3 Containment Building Elev. 46'0"

PFP-302, U3 Containment Building Elev. 68'0"

PFP-303, U3 Containment Building Elev. 95'0"

Condition Reports (CR-IP3-)

2011-01899

**Section 1R06: Flood Protection Measures**Work Orders

52307318

**Section 1R08: Inservice Inspection (ISI)**Condition Reports (CR-IP3-)

2011-00800 2011-01546\* 2011-01529\* 2011-01350 2011-01102 2011-01043

A-3

2010-03640	2010-03359	2010-00513	2010-00189	2010-00141	2009-04380
2009-02381	2009-02344	2009-02172	2009-01631	2009-01368	2009-01366
2009-01335	2009-01103	2009-01016	2009-00898	2009-00840	2009-00779
2007-03452	2007-01802	2007-00968	2005-01956	2005-01974	2005-02006
2005-01050	2005-01032	2005-01031	2005-00805		

\*Denotes this Notification was generated as a result of this inspection

Condition Reports (CR-IP2-)

2010-01146

Section XI Repair/Replacement Samples

Repair/Replacement 10-3-64/WO 226647-01; Install New Containment Spray Vent

Operating Experience Reports

ENR PAR 08-002, Doel Unit 1 Corrosion on Bolts of Reactor Coolant Pump of Unit 1 Following a Leak on Flange

LER 50-395/2003-004-00, Virgil C. Summer Reactor Coolant Pump Seal Injection Nozzle Leakage

Drawings and Sketches

Entergy DWG. No. 9321-F-20J75, Indian Point Unit 3 Nuclear Power Plant Operator Aid for Assisting In Draindown Of RCS System, Rev. 6, March 23, 2009

Consolidated Edison Co. DWG. A226192-18, Indian Point Unit #2, General Assembly Shaft Seal Pump, Reactor Coolant Pump, Rev. 14, April 7, 1981

TRANSCO PRODUCTS DWG. KH-8681-D1, IP3 RPV Top Head (Dome) Insulation Key Layout, September 2, 2002

TRANSCO PRODUCTS DWG. KH-8681-D2, IP3 RPV Top Head (Dome) Insulation Layouts D1 and D2, September 2, 2002

TRANSCO PRODUCTS DWG. KH-8681-D3, IP3 RPV Top Head (Dome) Insulation Layouts D3 and D4, September 2, 2002

Engineering Analyses and Calculations and Standards

IP-CALC-05-00989: Evaluation of the 33 RCP Main Flange Studs With a Leaking Main Flange Gasket, April 8, 2005

Entergy Engineering Report No.: IP-RPT-07-00093, Boric Acid Corrosion Control Program, Rev. 2, August 24, 2010

IP3-CALC-RV-03720, Estimation of Effective Degradation Years (EDY) for IP3 RV Head, Rev. 2  
Entergy Engineering Report: 3R14 Condition Monitoring and Operational Assessment of Indian Point 3 Steam Generators, IP-RPT-07-00031, Rev. 0, March 24, 2007

Entergy Engineering Report: Steam Generator Degradation Assessment for 3R14 Refueling Outage, IP-RPT-06-00186, Rev. 1, March 9, 2007

Entergy Engineering Report: IP-RPT-SG-01796, Indian Point Steam Generator Program, Rev. 8, July 26, 2007,

Weld Records

Procedure Qualification (PQR) 598, Manual GTAW, SMAW, June 1, 1989

Physical Test Report of Welding Procedure Qualification Tests, PO-89-081, GTAW, SMAW, May 25, 1989

Entergy Nuclear Northeast Welding Procedure Specification Approval Sheet, WPS Title, SS-8/8-B, Rev. 2, June 8, 2005  
Entergy Nuclear Northeast Welding Procedure Specification Number SS-8/8-B, Rev. 2, June 8, 2005  
Certificate of Method Qualification #56307, March 8, 2011  
NDE Qualification & Certification Record, July 22, 2011  
WO Number 00226647, ENN Weld Map, September 2, 2010  
Entergy Nuclear Northeast Multiple Weld Data Sheet, ENN-DC-3000 Attachment 9.7  
Radiographic Inspection Report, Entergy Procedure CEP-MDE-255, Rev. 5, November 24, 2010  
Entergy Nuclear Welder Performance Qualification Test Instructions, Standard 72, Rev. 0, November 2, 2010  
Entergy Nuclear Welding Program, CEP-WP-002, Welding Procedure Specification, WPS-CS-1/1-A, Rev. 0, April 29, 2010

Evaluation/Screening of Boric Acid Leakage

11-3-01, March 21, 2011 (addresses CR-IP3-2011-01043)  
09-3-07, October 5, 2009 (addresses CR-IP3-2009-03223)  
09-3-03, June 23, 2009 (addresses CR-IP3-2009-02381)  
09-3-04, June 23, 2009 (addresses CR-IP3-2009-02381)  
09-3-02, June 22, 2009 (addresses CR-IP3-2009-02172)

System and Program Health Reports and Self-Assessments

Indian Point Unit 3, Reactor Coolant System Health Report, 3rd Quarter 2010  
Indian Point Unit 3, Reactor Coolant System Health Report, 4th Quarter 2010  
IPEC Snapshot Self-Assessment Report; Department: Programs and Component Engineering; Title: Indian Point Steam Generator Programs Condition Report LO-IP3LO-2010-00171, June 22-24, 2010  
IPEC Snapshot Self-Assessment Report, 6/2/2008; Boric Acid Corrosion Control Program (BACCP): Learning Organization Condition Report LO-HQNLO-2008-00038, July 24, 2008

Program Documents

NEI 03-08, January 2010; Guidelines for the Management of Materials Issues, Rev. 2  
IP-RPT-07-00093, Boric Acid Corrosion Control Program, Rev. 2  
WCAP-15988, Generic Guidance for an Effective Boric Acid, Inspection Program for Pressurized Water Reactors, Rev. 1, February 2005  
EN-DC-202, NEI 03-08 Materials Initiative, Rev. 4, February 1, 2010  
EPRI Report 1000975, Boric Acid Corrosion Guidebook, Managing Boric Acid Corrosion Issues at PWR Power Stations, Rev. 1, November 2001  
Entergy Engineering Report No. IP3-RPT-SG-01796, Indian Point 3 Steam Generator Program, Rev. 8, July 26, 2007  
Entergy Engineering Report No. IP3-RPT-06-00186, Steam Generator Degradation Assessment for 3R14 Refueling Outage, Rev. 1, March 9, 2007  
Entergy Engineering Report No. IP3-RPT-07-00031, 3R14 Condition Monitoring and Operational Assessment of Indian Point 3 Steam Generators, Rev. 0, March 24, 2007  
Entergy Program No. CEP-BPT-0100, Buried Piping and Tanks Inspection and Monitoring, Rev. 0, October 26, 2009

Procedures

EN-DC-319, Inspection and Evaluation of Boric Acid Leaks, Rev. 6, August 12, 2010  
 EN-LI-102, Corrective Action Process, Rev. 16, November 1, 2010  
 EN-DC-202, NEI 03-08 Materials Initiative, Rev. 4, February 1, 2010  
 Wesdyne Document WDI-TJ-1028, ASME Section V, Article 14, Technical Justification for Eddy Current Inspections of RVH, Rev. 2, January 11, 2011  
 Wesdyne Document WDI-PJF-1304808-EPP, Examination Program Plan for Indian Point Unit 3 3R16 Reactor Vessel Head Inspection, Rev. 1, January 3, 2011  
 Entergy Procedure IP-MM-AD-107, Intraspsect Eddy Current Inspection of Vessel Head Penetration J-welds and Tube OD Surfaces (WDI-ET-002, Rev. 13), Rev. 0, January 24, 2011  
 Entergy Procedure IP-MM-AD-107, Intraspsect Eddy Current Analysis Guidelines (WDI-ET-004, Rev. 14), Rev. 0, January 24, 2011  
 Entergy Procedure IP-MM-AD-107, Procedure for Ultrasonic Examination of Reactor Vessel Head Penetrations (WDI-STD-1040, Rev. 5 w. ECN 01 and 02), Rev. 0, January 24, 2011  
 Entergy Procedure IP-MM-AD-107, Reactor Vessel Head Penetration Ultrasonic Examination Analysis (WDI-STD-1041, Rev. 3 w. ECN 01 and 02), Rev. 0, January 24, 2011  
 Entergy Procedure IP-MM-AD-107, Procedure for Eddy Current Examination of Reactor Vessel Head Penetrations (WDI-STD-1042, Rev. 1), Rev. 0, January 24, 2011  
 Entergy Procedure IP-MM-AD-107, RPVH Nozzle Bottom OD Surface Eddy Current Inspection (WDI-STD-1068, Rev. 1), Rev. 0, January 24, 2011  
 Entergy Procedure EN-DC-343, Buried Piping and Tanks Inspection and Monitoring Program, Rev. 3, September 16, 2010

Work Order

IP3-03-10229

NDE Examination Reports & Data Sheets

IP3-PT-11-034, RCP-32, Seal Injection Pipe Fillet Weld to Thermal Barrier, March 21, 2011  
 IP3-UT-11-004, ASME Section XI, Pressurizer Nozzle Inside Radius Section, March 18, 2011  
 IP3-UT-11-039, MRP-146 Exam, RCS Loop 34 Drain, March 16, 2011  
 IP3-UT-11-038, MRP-146 Exam, RCS Loop 33 Drain, March 16, 2011  
 IP3-UT-11-036, MRP-146 Exam, RCS Loop 32 Drain, March 16, 2011  
 IP3-VT-11-010, ASME Section XI, 32 RCP Main Flange Bolting, March 13, 2011  
 WO # IP3-03-10220, PM Inspection of 32 RCP Main Flange Studs, April 6, 2003  
 IP3-VT-11-004, ASME Section XI, 31 Hot Leg Nozzle to Pipe Connection  
 IP3-VT-11-005, ASME Section XI, 32 Hot Leg Nozzle to Pipe Connection  
 IP3-VT-11-006, ASME Section XI, 32 Cold Leg Nozzle to Pipe Connection  
 IP3-VT-11-007, ASME Section XI, 33 Hot Leg Nozzle to Pipe Connection  
 IP3-VT-11-008, ASME Section XI, 34 Hot Leg Nozzle to Pipe Connection  
 IP3-MT-09-001, Reactor Vessel Integral Attachments, March 16, 2009  
 IP3-PT-09-001, Augmented Risk Informed PT Examination, March 18, 2009  
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#### **Procedures**

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#### **Procedures**

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02013					

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#### **Procedures**

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### **Section 1R15: Operability Evaluations**

#### **Procedures**

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 3-ARP-011, Panel SHF – Electrical, Rev. 33  
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 3-PT-Q120B, 32 ABFP Surveillance and IST, Rev. 18  
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 EN-DC-205, Maintenance Rule Monitoring, Rev. 2  
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2010-03098	2010-03295	2010-03354	2011-00098	2011-00232	2011-00496
2011-00680	2011-01001	2011-01002	2011-01879	2010-02630	2011-00038

#### Work Orders

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00262779					

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### **Section 1R18: Plant Modifications**

#### Procedures

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Work Orders

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Drawings

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**Section 1R19: Post-Maintenance Testing**

Procedures

3-PT-R007A, 31 & 33 ABFPS Full Flow Test, Rev. 18

3-IC-PC-I-P-406A, Auxiliary Boiler Feed Pump No. 31 Discharge Pressure, Rev. 14

3-BKR-016-CUB, Westinghouse 480V Switchgear Cubicle Inspection and Cleaning, Rev. 10

3-BKR-017-ELC, Current Sensor and/or Trip Unit Replacement, Setting, and Testing, Rev. 9

3-BKR-004-ELC, Inspection, Lubrication, and Testing of Westinghouse 480 Volt DS-416 and DS-840 Breakers, Rev. 46

Completed Procedures

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00910	00915	00927	00926	01727
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Work Orders

263415	271150	52300105	52260537
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Drawings

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9321-LL-31313, Miscellaneous Solenoid Valves

Miscellaneous

156-100000190, SCR/SCRF Battery Charger 3 Phase Input Vendor Manual, Rev. 1

**Section 1R20: Refueling and Other Outage Activities**

Procedures

3-SOP-RCS-017, Reactor Vessel Vacuum Refill and Mansell Level Monitoring System Operation, Rev. 10  
3-SOP-RP-020, Draining the RCS/Refueling Cavity, Rev. 31  
3-POP-3.1, Plant Shutdown From 45% Power, Rev. 44  
3-POP-3.2, Plant Recovery From Trip, Hot Standby, Rev. 1  
3-POP-3.3, Plant Cooldown – Hot to Cold Shutdown, Rev. 49  
3-PT-V053B, Power Reduction Surveillance Requirements, Rev. 4  
E-0, Reactor Trip or Safety Injection, Rev. 21  
ES-0.1, Reactor Trip Response, Rev. 18

**Section 1R22: Surveillance Testing**

Procedures

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Completed Procedures

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**Section 2RS1/2RS3: Radiological Hazard Assessment and Exposure Controls  
Procedures and In-Plant Airborne Radioactivity Control and Mitigation**

Procedures

EN-RP-101, Access Control for Radiological Controlled Areas, Rev. 5  
EN-RP-105, Radiological Work Permits, Rev. 9  
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2010-2817    2011-0091    2011-0560    2011-0947

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**Section 2RS4/2RS5: Occupational Dose Assessment/Radiation Monitoring  
Instrumentation**

Procedures

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EN-RP-105, Radiological Work Permits, Rev. 9  
EN-RP-303, Source Checking of Radiation Protection Instrumentation  
O-CY-1420, Radiological Quality Assurance Program, Rev. 3  
2-PC-EM29, Wide Range Gas Effluent Radiation Monitor R-27 Transfer Calibration, Rev. 9  
2-PC-EM30, Process Radiation Monitor R-41/42 Calibration, Rev. 12

2-PC-EM31, Effluent Radiation Monitor R-43/44 Calibration, Rev. 10  
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3-PC-OL58A, Process Radiation Monitor R-11/12 Calibration, Rev. 2  
3-PC-R14, Process Radiation Monitor R-14 Calibration, Rev. 23  
3-PC-OL58G, Waste Radiation Monitor R-18 Calibration, Rev. 5  
3-PC-OL36, Wide Range Gas Monitor R-27 Channel Calibration, Rev. 4  
3-PC-OL52, Sanitary Sewer System Radiation Monitor Calibration R-56, Rev. 4

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QA-14/15-2009-IP-1, Quality Assurance Audit of IPEC Radiation Protection and Radwaste  
QS-2010-IP-006, Quality Surveillance Evaluation of corrective actions for QA audit  
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**Section 40A1: Performance Indicator Verification**

Procedures

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Completed Procedures

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EN-LI-114, Performance Indicator Process – Unplanned Scrams per 7,000 Critical Hours, dated July 8, 2010  
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EN-LI-114, Performance Indicator Process – Unplanned Scrams with Complications, dated April 5, 2010  
EN-LI-114, Performance Indicator Process – Unplanned Scrams with Complications, dated July 8, 2010  
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EN-LI-114, Performance Indicator Process – Unplanned Scrams with Complications, dated January 7, 2011  
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EN-LI-114, Performance Indicator Process – Unplanned Power Changes per 7,000 Critical Hours, dated July 8, 2010  
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EN-LI-114, Performance Indicator Process – Unplanned Power Changes per 7,000 Critical Hours, dated January 7, 2011

**Section 40A3: Event Follow-up**

Procedures

3-AOP-SW-001, Service Water Malfunction, Rev. 2  
3-ONOP-ES-3, Passive Failure During Recirculation, Rev. 11  
OAP-034, Safety Function Determination Process, Rev. 2

A-12

3-AOP-LEAK-1, Sudden Increase In Reactor Coolant System Leakage, Rev. 6

Condition Reports Condition Reports (CR-IP3-2011)

00787	00680	00688	00691	00692	00697
00756	00761	00770	00869		

Work Orders

266947

Drawings

9321-F-27363, Flow Diagram Chemical & Volume Control System, Sh. No. 1, Rev. 51

**LIST OF ACRONYMS**

ABFP	Auxiliary Boiler Feed Pump
ACE	Apparent Cause Evaluation
ADAMS	Agency-Wide Document and Management System
ALARA	As Low As Is Reasonably Achievable
AOT	Allowed Outage Time
ARM	Area Radiation Monitor
ASME	American Society of Mechanical Engineers
BAC	Boric Acid Corrosion
BC	Battery Charger
CAM	Continuous Air Monitor
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Corrective Action Report
DAC	Derived Airborne Concentration
DID	Defense-In-Depth
DRA	Deputy Regional Administrator
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EC	Eddy Current
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
ENTERGY	Entergy Nuclear Northeast
EPD	Electronic Pocket Dosimeter
EPRI	Electric Power Research Institute
FSAR	Final Safety Analysis Report
HEPA	High-Efficiency Particulate Air
HRA	High Radiation Area
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	[NRC] Inspection Procedure
IPEC	Indian Point Energy Center
IR	Inspection Report
ISI	Inservice Inspection
IST	Inservice Testing
LER	Licensee Event Report
MT	Magnetic Particle Testing
NCV	Non-Cited Violation
NDE	Nondestructive Examination
NEI	Nuclear Energy Institute
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
NSTS	National Source Tracking System
NVLAP	National Voluntary Laboratory Accreditation Program
ODCM	Offsite Dose Calculation Manual
OSL	Optically Stimulated Luminescence
PFP	Pre-Fire Plan
PI	Performance Indicator
PQR	Procedure Qualification Record (Welding Procedures)

PT	Dye Penetrant Testing
QA	Quality Assurance
RA	Regional Administrator
RCA	Radiological Controlled Area
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RI	Resident Inspector
RI OEDO	Region I Office of the Executive Director for Operations
RVCH	Reactor Vessel Closure Head
RWP	Radiation Work Permit
SDP	Significance Determination Process
SG	Steam Generator
SL IV	Security Level IV
SRI	Senior Resident Inspector
SSC	Structure, System, and Component
TS	Technical Specification
UFSAR	Updated Final Safety Evaluation Report
UT	Ultrasonic Testing
VC	Vapor Containment
VHRA	Very High Radiation Area
VT	Visual Examination
WO	Work Order
WPS	Weld Procedure Specification